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ABSTRACT

Compared were the performances of 45 normal and 45 slow learners (all in junior high school) on a task of original and relearning of paired associate responses as a result of induced success or failure following each response. Ss were asked to pair stick figures with consonant trigrams and then told their performance was either correct or wrong depending on the treatment condition assigned. The type of S (whether normal or slow learning) x treatment condition interaction was not found to be significant in any of the analyses. (Author/DB)

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Effects of Induced Success and Failure on Learning and Retention Disorders in Children

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Rotter's (1954) social learning theory has generated a number of research studies (e.g., Heber, 1967; Gardner, 1958; Nardi, 1965 & Simpson, 1962) to assess the retentive abilities of slow learners (SL) in comparison with normal children (NC). This research has typically used adolescent or Ss under age 10 from heterogeneously institutionalized populations, and has provided verbal or material reinforcement following the completion of a trial and not the response in a paired-associate (PA) learning task. In contrast to the above studies, the present study used a) pre-adolescent Ss of 12-15 years attending normal public schools, and b) stimulus conditions generating expectancy of material reinforcement following each correct response in a PA learning task instead of after the trial. Thus, the experiment compared original and relearning (after 24 hours) performances, on a PA task, of NC and MR as a result of induced success or failure.

Method

Subjects. Forty-five NC and forty-five SL attending two junior high schools in the same school district served as Ss in the experiment. Mean IQ of NC was 109.71 (range, 100-131), and average CA was 163 months (range, 140-176 months). The SL Ss mean IQ was 70.36 (range, 55-84) and mean CA was 162.13 months (range, 140-180 months).

Design. Fifteen NC and fifteen SL Ss were randomly assigned to one of three conditions--induced success, failure or the control condition. The design conformed to a 2 x 3 factorial analysis of variance (Anova) with two dependent measures--original learning

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and relearning.

Learning Materials. Five stick nonsense figures (stimulus terms) were paired with five consonant trigrams [CCC (response terms)]. The PAs were presented on 3" x 5" plastic-coated cards.

Procedure.

Original Learning. Ss were tested individually. Following an initial warm-up conversation, all Ss were presented with 3" x 5" cards containing a letter from each response term. The Ss were given 5 seconds to read the letter aloud. All Ss then were told that the E was playing a game and that the E was going to show some letters that "went along" with some pictures. The Ss were told to remember the pictures and the letters, as later they would be asked to tell the letters that went along with the pictures. The S-R pairs were printed on one side of the card and the respective stimulus term printed on the other side of the card. The Ss were familiarized with both sides of the card and their purposes by showing them each side. The PAs were presented for 5 seconds during which the Ss were asked to read the CCC aloud. The order of presentation was varied randomly on each learning and test trial. In the test trial, Ss were asked "to tell the letters that go along with each picture." The stimulus terms were presented for 5 seconds each. Correct responses were shown to each S following errors in recall. The inter-trial interval was 30 seconds.

S in the "success" condition were informed that "for each correct response you will get a dime." The Ss were reinforced accordinly following each correct response. In the "failure" condition, the Ss were told "if you do not make any mistakes, you have a chance of winning up to $1.50." However, after each

successful trial, these Ss were told "Oh! You made too many mistakes this time. I am sorry you cannot win anything. Let us see, how you do next time." The "control" Ss received the standard PA test instructions and were told to go as fast as possible on the first two trials and faster on the third trial. No reinforcement or comments were made following correct responses.

Relearning. All Ss were required to learn the same material after 24 hours. The procedure for all Ss was the same as for the control Ss on the first day.

Dependent Measures. The total number of trials taken by the S to reach the criterion of three correct repetitions of the response on the first day was considered as a measure of original learning. On the second day, savings in the number of trials required to reach the established criterion of three correct repetitions of the response were considered as a measure of relearning.

Results.

Since there were two dependent variables, multivariate (MV) Anova was used to test all the sources of variance, i.e., type of Ss (NC vs. MR), Treatment conditions (success, failure and control), and the interaction between type of Ss and treatment conditions. Univariate Anova was done on the dependent variables separately in case the MV, F was significant.

The first analysis was done without using any covariates. This analysis showed that there were significant differences between NC and SL /MV, $F(2, 83) = 16.7906$, $p < .0001$/. To determine the locus of effects, univariate tests were done on each of the dependent variables. For original learning, the univariate

analysis revealed F (1,84) = 12.8167, p<.0006 and for relearning F (1,84) was 30.7265, P<.0001. Thus, NC performed significantly better on both the dependent variables. The mean trials to learn the criterions for original learning for NC was 52.64 and SL = 67.82, and for relearning NC = 18.96 and SL = 34.71. There was no effect due to differential treatment for both the dependent measures ⌈MV, F (4,166) 1⌉.

The interaction between the type of Ss and treatment was also not significant ⌈MV, F (4,166) = 1.1913, p<.32⌉.

A second analysis was performed on just the relearning data using original learning as a covariate. The results remained the same as the first analysis. A third analysis used MA as covariate for both the dependent variables. The results were consistent with the first analysis for the interaction and the treatment effects. However, there were no differences between the NC and MR on both the dependent measures, ⌈MV, F (2,82)<1⌉. A fourth analysis was done using CA as covariate. The main effect of type of Ss was significant ⌈MV, F (2,82) = 14.9907, p<.0001⌉. The univariate analysis indicated NC performed significantly better on the original learning ⌈F (1,83) = 12.3336, p<.0008⌉ and also on the relearning measure ⌈F (1,83) = 27.2213, p<.0001⌉. There were differences due to treatment effect ⌈MV, F (4,164) = 2.1894, p<.07⌉ but only with respect to relearning ⌈F (2,83) = 2.4115, p<.10⌉ and not with respect to original learning ⌈F (2,83)<1⌉. The mean number of trials to learn for relearning data for the success, failure, and control conditions were 24.26, 31.69 and 24.56 respectively, indicating Ss did poorly in the failure condition as compared to success and control conditions. The interaction between type of Ss and treatment was not significant ⌈MV, F (4,164) = 1.5244, p<.20⌉. Finally, both MA and CA were

used as covariates. This analysis showed no differences in NC and MR on both the original learning and relearning measures [MV, F (2,81) = 1.7709, $p<.187$. The differences due to treatment were also significant [MV, F (4,162) = 2.0772, $p<.097$. Further analysis indicated significant differences in relearning [F (2,82) = 2.398, $p<.107$ but no differences in original learning [F (2,82)$<1$7. The interaction effect was not significant [MV, F (4,162) = 1.4973, $p<.217$.

Discussion.

The different analyses yielded an interesting pattern of results. If one considers the analysis without the covariates, the NC and SL groups performance was significantly different from each other. Similar results were obtained when CA was covaried. However, differences disappeared when MA was covaried alone or in combination with CA. This perhaps indicates that difference between NC and MR's could be attributed to differences in MA. Regarding the main effect of treatments, there were no differences on the original learning data across analyses. However, the main effect of treatment was significant when CA was covaried alond ($p<.07$) or in combination with MA ($p<.10$) for relearning data. Examination of the mean for relearning in these analyses indicated that Ss performed poorly in the failure condition as compared to success and control conditions. However, these differences do not show up when MA or the degree of original learning are covaried in the analysis. Neither, were there any differences due to the treatment when no covariates were used in the analysis. Due to inconsistencies in the pattern of results it seems best to suspend judgment on differential effect of the treatments.

The interaction between type of Ss and the treatment was of

central concern to this study. The finding was consistent across the analyses that the type of Ss x treatment interaction was not significant, indicating NC and SL's performance was not differentially influenced by variation in treatment for the original and relearning data. It may be noted that only one set of stimulus material was used in the study and the results may be confounded with the stimulus set used in the study. Hence, more studies are needed with several PA lists of different levels of complexity before any valid conclusions can be drawn about effects of induced success and failure on PA learning.